

Amendment to Claims

1-12 (canceled).

13 (currently amended): ~~An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:~~

~~a rotational member for rotating with an article held in the end effector, the article being rotatable around an axis passing through the article; and~~

~~a device for pressing the article against the rotational member to hold the article in the end effector and cause the article to rotate around said axis when the rotational member rotates in the end effector;~~

The apparatus of Claim 52 wherein the article has a first, substantially planar, surface facing the rotational member and a second, substantially planar, surface opposite to the first surface, and the end effector rotational member contacts the first surface of the article but not the second surface of the article when the device presses the article is held by the end effector against the rotational member.

14 (canceled).

15 (currently amended): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:

a rotational member for contacting and rotating with an article held [[in]] by the end effector; ~~, the article being rotatable around an axis passing through the article;~~

~~wherein the end effector further comprises:~~

a body ~~to which the member is coupled and around~~ relative to which the rotational member and the article held by the end effector are rotatable ~~is rotational~~; and

a device for pressing the article against the rotational member when the end effector is holding the article;

wherein the device comprises a vortex chuck mounted in the body to emit a gas vortex towards the article.

16 (currently amended): The apparatus of Claim 15 wherein the article held by the end effector is rotatable by the rotational member around an axis passing through the article
~~vortex chuck is mounted in the body.~~

17 (currently amended): ~~An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising a rotational member for contacting the article held in the end effector and for rotating the article, wherein both the rotational member and the article rotate around an~~ The apparatus of Claim 52 wherein the first axis passing passes through the article when the rotational member rotates the article.

18 (currently amended): The apparatus of Claim ~~[[17]]~~ 52 wherein the ~~end effector~~ further body comprises a device for pressing the article against the rotational member when the end effector is holding the article.

19 (currently amended): ~~An apparatus comprising an end effector for being attached to an arm of a robot and for transporting articles between different stations under a control of the robot, the end effector holding an article as the article is being transported between different stations, the end effector comprising a mechanism for holding an article as the article is rotated around an axis passing through the end effector;~~

The apparatus of Claim 52 wherein the mechanism comprises further comprising a vortex chuck to emit a gas vortex towards the article to press the article against the rotational member.

20 (currently amended): The apparatus of Claim 19 wherein the vortex chuck is mounted in ~~[[a]]~~ the body of the end effector.

21-24 (cancelled).

25 (currently amended): The apparatus of Claim 13 wherein ~~the end effector further comprises a body to which the member is coupled and around which the member is rotatable;~~ and in addition to being rotatable around the first axis ~~the body~~, the rotational member is movable relative to the body in a direction ~~opposite~~ away from the article to yield when the article is held ~~[[in]]~~ by the end effector and the end effector presses the second surface of the article against a third surface not belonging to the article and not belonging to the end effector.

26 (previously presented): The apparatus of Claim 25 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the third surface.

27 (currently amended): The apparatus of Claim ~~[[13]]~~ 52 wherein the articles are semiconductor wafers.

28 (currently amended): The apparatus of Claim ~~[[13]]~~ 52 wherein the different stations include one or more of: a wafer storage cassette, a wafer shipment container, an etching station, a deposition station, a film frame machine for attaching adhesive film frames to wafers, a dicing station.

29 (currently amended): The apparatus of Claim ~~[[13]]~~ 52 further comprising a robot comprising an arm to which the end effector is attached.

30 (currently amended): The apparatus of Claim ~~[[13]]~~ 54 wherein the apparatus is programmed to:

pick up an article by the end effector from a first station;

carry the article to a second station comprising the rotation device to perform a rotational orientation of the article in the end effector without the end effector releasing the article; and

after the rotational orientation, carry the article in the end effector to a third station.

31 (previously presented): The apparatus of Claim 30 wherein the apparatus is programmed to place the article at the third station, the article remaining in the end effector from the time the article was picked up at the first station and up to the time the article is placed at the third station.

32 (currently amended): The apparatus of Claim [[17]] 15 wherein the articles are semiconductor wafers.

33 (currently amended): The apparatus of Claim [[17]] 15 wherein the different stations include one or more of: a wafer storage cassette, a wafer shipment container, an etching station, a deposition station, a film frame machine for attaching adhesive film frames to wafers, a dicing station.

34 (currently amended): The apparatus of Claim [[17]] 15 further comprising a robot comprising an arm to which the end effector is attached.

35 (currently amended): The apparatus of Claim [[17]] 15 wherein the apparatus is programmed to:

pick up an article by the end effector from a first station;

carry the article to a second station to perform a rotational orientation of the article in the end effector without the end effector releasing the article; and

after the rotational orientation, carry the article in the end effector to a third station.

36 (previously presented): The apparatus of Claim 35 wherein the apparatus is programmed to place the article at the third station, the article remaining in the end effector from the time the article was picked up at the first station and up to the time the article is placed at the third station.

37 (previously presented): The apparatus of Claim 13 wherein the device emits a gas flow that flows towards the article through an opening in the end effector to draw the article towards the end effector.

38 (currently amended): The apparatus of Claim 15 wherein the rotational member is movable relative to the body in a direction ~~opposite~~ away from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

39 (previously presented): The apparatus of Claim 38 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the end effector is holding the article and is pressing the article against the surface not belonging to the article and not belonging to the end effector.

40 (previously presented): The apparatus of Claim 17 further comprising a device for emitting a gas flow that flows towards the article through an opening in the end effector to draw the article towards the end effector

41 (currently amended): The apparatus of Claim 52 ~~[[17]]~~ wherein ~~the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and~~ the rotational member is movable relative to the body in a direction ~~opposite~~ away from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

42 (previously presented): The apparatus of Claim 41 wherein the end effector further comprises a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

43-44 (canceled).

45 (currently amended): ~~An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising a rotational member for contacting the article held in the end effector and for rotating the article around an axis passing through the article; The apparatus of Claim 52 wherein the rotating article being is~~ stationary relative to the rotational member.

46 (currently amended): The apparatus of Claim ~~[[45]]~~ 53 wherein ~~the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and~~ the member is movable relative to the body in a direction ~~opposite~~ away from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

47 (previously presented): The apparatus of Claim 46 wherein the end effector further comprises a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

48 (previously presented): The apparatus of Claim 45 wherein the articles are semiconductor wafers.

49 (currently amended): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:

a body;

a rotational member coupled to the body and rotatable ~~around~~ relative to the body, for contacting the article held ~~[[in]]~~ by the end effector and for rotating the article around an axis passing through the article; and

a device for pressing the article against the rotational member;

wherein the rotational member is movable relative to the body in a direction ~~opposite~~ away from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

50 (previously presented): The apparatus of Claim 49 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

51 (new): The apparatus of Claim 15 wherein the end effector is operable to hold the article without the body contacting the article.

52 (new): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:

a body; and

a rotational member rotatable around a first axis which is stationary relative to the body, the rotational member being rotatable relative to the body when the rotational member rotates around the first axis, the rotational member being for contacting and rotating the article held by the end effector around the first axis, the article being rotatable relative to the body when rotated around the first axis.

53 (new): The apparatus of Claim 52 wherein the end effector is operable to hold the article without the body contacting the article.

54 (new): The apparatus of Claim 52 wherein at least a portion of the rotational member is operable to be contacted by a rotation device external to the end effector, wherein the rotation device is operable to rotate the rotational member to cause the article to rotate around the first axis as the article is held by the end effector, wherein the end effector is operable to travel with the article to the rotation device to perform a rotational orientation of

the article with the article held by the end effector, and the end effector is operable to travel with the article away from the rotation device.